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RESPONSE

To: Commissioner of the Patent Office

1. Indication of International Application: PCT/JP2004/017979

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4. Contents of Response

(1) In the statement, the novelty of the invention defined in Claim 1 and the inventive step of the inventions defined in Claim 1 to Claim 5 of the present application were denied, but this statement is refuted as follows. Among Claim 1 to Claim 5, Claim 1, Claim 3, Claim 4 and Claim 5 are amended as in an Amendment filed with this Response. Claim 2 is incorporated into Claim 1, and is therefore deleted.

(2) The invention defined in Claim 1 of the present application relates to a humidity indicator, comprising at least one humidity-determining face which is provided on a surface of a humidity-determining plate comprising cobalt chloride held in a base paper sheet, so that the cobalt chloride is exposed to the humidity-determining face, whereby humidity is determined by the discoloration of the cobalt chloride on the humidity-determining face, and in particular it is characterized by the following arrangement.

“the humidity indicator further includes a first film covering the surface of the humidity-determining plate and forming the surface of the humidity indicator, and a second film covering the back of the humidity-determining plate and forming the back of the humidity indicator;

a flat air layer is formed at least between the first film and the surface of the humidity-determining plate, so that the entire surface of the humidity-determining face faces to the air layer;

a plurality of small holes are formed at distances from one another in the first film to permit the direct communication of the air layer with the atmosphere;

the first and second films are formed to protrude from an outer peripheral edge of the humidity-determining plate and bonded at outer peripheral edge portions thereof directly to each other; and

the first and second films are bonded in a compression manner to a portion of the humidity-determining plate surrounding a region corresponding to the air layer."

With the above arrangement, the surface and back of the humidity-determining plate are covered with the first and second films. Therefore, even if an operator directly picks the humidity indicator with his or her hand, the cobalt chloride on the humidity-determining face can be prevented effectively from adhering to the hand and thus, entering into the operator's body, and the operator can handle the humidity indicator without anxiety. In addition, the humidity indicator is of such a structure that even if fine dust (such as paper scraps and fiber) is generated from the base paper sheet of the humidity indicator, it is blocked off each of the films and hard to be diffused to the outside. Therefore, even if the humidity indicator is sealedly accommodated along with electronic parts and the like adversely affected by dust, the influence of dust to the electric parts can be prevented effectively.

Further, the flat air layer is formed between the first film and the surface of the humidity-determining plate, so that the entire humidity-determining face faces to the air layer, and the plurality of small holes are formed at the distances from one another in the first film to permit the direct communication of the air layer with the atmosphere. Therefore, when the humidity indicator has been taken in the atmosphere out of a sealed storage container or the like whose inside is kept in a low-humidity state, a time lag is ensured which is moderate for the humidity in the air layer to be changed in accordance with the humidity in the atmosphere. Therefore, a time lapsed to a time point of discoloration of the humidity-determining face (a time required for the discoloration) can be set moderately. This is effective for preventing

the erroneous determination or the arising of a trouble, which is likely caused when the time is relatively short. Moreover, the length of the time lag (and hence, the time required for the discoloration) can be regulated easily in accordance with the purpose of use, the working environment and the like by properly setting the density of dispersion, the inside diameter and the like of the plurality of small holes. In addition, if the humidity-determining face is provided to face directly to the small holes, then there is a problem that only the cobalt chloride at a portion corresponding to each of the small holes is partially discolored, and as a result, the appearance is degraded, and moreover, the determining operation is hard to conduct. However, according to the present invention, the air layer is interposed between the small holes and the humidity-determining faces and hence, not only the portions corresponding to the small holes but also the entire surfaces of the humidity-determining faces can be discolored uniformly, and thus, such problem can be eliminated.

Additionally, the first and second films are formed to protrude from the outer peripheral edge of the humidity-determining plate, and bonded at their outer peripheral edges directly to each other. Therefore, the outer peripheral edge of the base paper sheet can be covered completely with the first and second films and hence, it is possible to reliably prevent the generation and diffusion of dust from a cut face of the outer periphery of the base paper sheet. In addition, because the films are bonded directly to each other, it is possible to carry out the bonding operation relatively easily and reliably, leading to the simplification of the bonding step.

Further, since the first and second films are bonded in a compression manner to a portion of the humidity-determining plate surrounding a region corresponding to the air layer, it is possible to minimize the diffusion of the dust generated from the base paper sheet to the outside.

It should be noticed here that the amount of the dust generated from the base paper sheet and diffused outside has a large difference depending on whether or not the base paper sheet is covered by the film. When the inventor, etc. tested using a tumbling type dust generating testing machine, in the case of a base paper sheet not covered by the film, the amount of grains having a diameter equal to or larger than $0.3\ \mu\text{m}$ and smaller than $25\ \mu\text{m}$ becomes 3411.5/sec, whereas in the case of a base paper sheet covered by the film, the amount of grains having the same diameter becomes 2.5/sec, decreasing drastically, resulting in a distinguished difference between the two cases. That is, in the case of the base paper sheet covered by the film, the generation of the dust diffused outside can almost be prevented. The present invention has been proposed based on such experimental result.

According to the present invention, as described above, the first and second films are formed to protrude from the outer peripheral edge of the humidity-determining plate and bonded at outer peripheral edge portions thereof directly to each other, and further, the first and second films are formed to be bonded in a compression manner to a portion of the humidity-determining plate surrounding a region corresponding to the air layer. Therefore, such undesirable generation and diffusion of dust can be prevented in a most effective way with a simple structure, and even if the humidity indicator is sealedly accommodated in a container along

with electronic parts, the influence of dust to the electronic parts can be prevented as much as possible.

(3) On the contrary, among the documents cited in order to reject the novelty and the inventive step of the present application, the embodiment in Fig.3 in Japanese Patent Application Laid-open No. 2000-107551 shows a drying agent 1 having a humidity detecting tape 4, an air layer 9 and a perforated film 6 superposed on dual packaging members 3 between which a drying agent 2 is charged. The Examiner indicates "a surface of a packaging member 7" in this document as a member corresponding to a second film of the present application. As is apparently described in Claim 1 which is amended this time, however, a humidity indicator according to the present invention has a very simple structure in that both of the surface and back thereof are covered by the first and second films, and a humidity-determining plate is clamped between the films, and has a basic structure which is absolutely different from that of the citation in which the drying agent 2 has to be accommodated inside.

In addition, the packaging member 3 and the humidity detecting tape 4 are exposed outside in left edge portions thereof, as is apparent from Fig.3, and do not dissolve the conventional problems as described above in association with the present invention.

The Examiner shows his opinion that it is obvious for a person skilled in the art to form the humidity detecting tape 4 of the above document having the film protruded to bond its outer periphery, considering the teaching of another document, Japanese Patent Application Laid-open No. 64-69951.

However, a humidity indicator according to the present invention defined in Claim 1 which is amended this time has a structure that the first and second films are bonded in a compression manner to a portion of the humidity-determining plate surrounding a region corresponding to the air layer, and the generation of dust can be minimized by bonding even the portion adjacent the air layer to the film in a compression manner as described above, and the diffusion of dust from the small holes of the film can be minimized. Such structure and effect cannot be obtained from a combination of the prior art documents asserted by the Examiner.

Since any teaching or suggestion to complement deficiency of the above two documents cannot be found in the other documents cited this time, the invention defined in Claim 1 has patentability apparently.

(4) Claim 3 to Claim 5 depend on the above-described Claim 1, and therefore have patentability as Claim 1 as a matter of course.

(5) As described above, the inventions defined in amended Claim 1 and Claim 3 to Claim 5 of the present application possess novelty and inventive step over documents cited this time, and should be granted a patent.

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